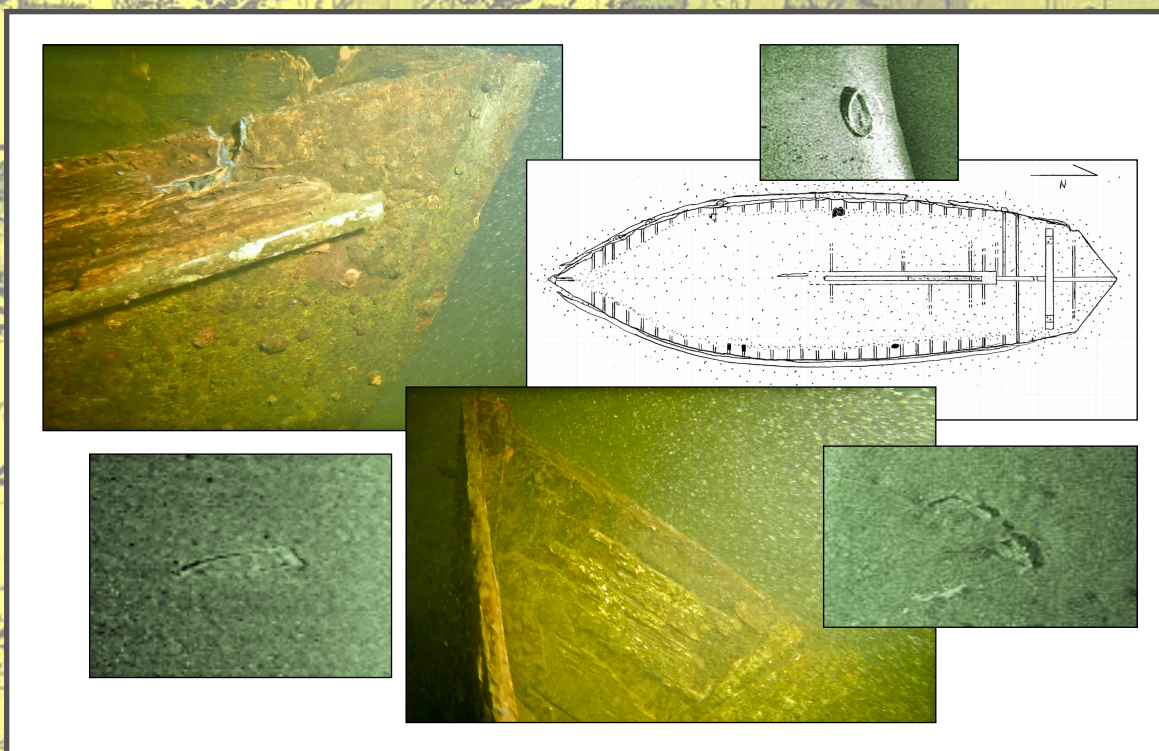


# MARITIME HERITAGE MINNESOTA



Ann Merriman  
Christopher Olson

## Suburban Lakes Nautical Archaeology 2 Project Report: Medicine Lake



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## Acknowledgments

Maritime Heritage Minnesota (MHM) thanks the People of Minnesota for their support of the Minnesota Historical and Cultural Heritage Grant program of the Arts and Cultural Heritage Fund of the Clean Water, Land and Legacy Amendment; without the MHCH Grant that MHM received to conduct this project, the work would not have been undertaken. MHM would also like to acknowledge the Grants Office of the Minnesota Historical Society for their expertise. We thank Bruce Koenen and Amanda Gronhvd of the Office of the State Archaeologist for their efforts. MHM appreciates the historical research efforts of Ted Hoshal and the resources of the Plymouth Historical Society. MHM could not have completed this project without the in-kind support of volunteer divers Josh Knutson, Kelly Nehowig, Ed Nelson, and Mark Slick. MHM thanks these talented and ethical men for their time and skill. We also thank our volunteer Betty Lloyd for her constant support. Lastly, MHM thanks our Board of Trustees Mike Kramer, Deb Handschin, and Steve Hack for their continued support of MHM's Mission.

Underwater Archaeologist  
Christopher Olson



Underwater Archaeologist  
Ann Merriman



Volunteer Diver  
Kelly Nehowig



Volunteer Diver  
Mark Slick



Volunteer Diver  
Ed Nelson



Volunteer Diver  
Josh Knutson



Trustee  
Steve Hack



Chair  
Mike Kramer



Mascots & Computing Cats  
Weebles Cat & Rodney Cat



Volunteer  
Betty Lloyd



Volunteer Dive Crew  
Ann Nehowig



Trustee  
Deb Handschin



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*"ACHF grants have allowed a small St. Paul-based nonprofit, Maritime Heritage Minnesota (MHM), to re-establish the discipline of underwater archaeology in Minnesota. Without this support, MHM could not have conducted its groundbreaking nautical archeological and maritime historical research."*

*~Steve Elliott, Former Minnesota Historical Society CEO and Director, January 2015*



## Introduction

Wrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite, and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial – Maritime Heritage Minnesota's (MHM) deals with all of these types of sites throughout the State of Minnesota. MHM's Mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites – our shared Maritime History – for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statutes as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of *State v. Bollenbach* (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).



Respect the Diver Down Flag





## **Preface**

In 2016, during the Minnesota Suburban Lakes Survey Project (MSLS), MHM surveyed Upper and Lower Prior Lake (1,238 acres, Scott County), Lake Pulaski (702 acres, Wright County), Medicine Lake (886 acres, Hennepin County), Lake Johanna (213 acres, Ramsey County), Lake Sylvia (1,524 acres, Wright County), and Lake Elmo (206 acres, Washington County). Other MHM sonar survey and underwater archaeology projects have taken place in Lake Minnetonka, White Bear Lake, Lake Waconia, the Headwaters Mississippi River, and the Minnesota River. In 2017, during the Minnesota Suburban Lakes Nautical Archaeology 1 Project (MSLNA-1), MHM investigated 14 anomalies in Prior Lake, 10 anomalies in Lake Pulaski, and 5 anomalies in Lake Waconia in Carver County in order to answer specific questions about their natures. After the completion of the MSLNA-1 Project fieldwork, there is now 1 identified wreck on the bottom of Lake Waconia, 7 wrecks and 1 object in Lake Pulaski, and 3 wrecks, 3 maritime sites or objects, and 2 'other' site types on the bottom of Prior Lake. The anomalies were identified through underwater archaeological reconnaissance fieldwork using SCUBA, digital video, measured drawings, and maritime historical research. Of these 11 wrecks, 3 of them now have Minnesota archaeological site numbers.

## **Results of the Minnesota Suburban Lakes Nautical Archaeology 2 Project**

### **Research Design**

The purposes of the MSLNA-2 Project was to conduct targeted and comprehensive remote sensing sonar surveys using new and improved sonar equipment; and use underwater archaeological reconnaissance to answer questions about and determine the nature of specific anomalies. The lakes focused on during the project are Prior Lake, Lake Pulaski, Medicine Lake, and Lake Johanna. The targeted sonar scanning undertaken in Prior Lake and the comprehensive scanning undertaken in Lake Pulaski, Medicine Lake, and Lake Johanna greatly assisted MHM during data review; dozens of anomalies were identified as wrecks, objects, or false targets using only their acoustical signatures.

### **Methodology**

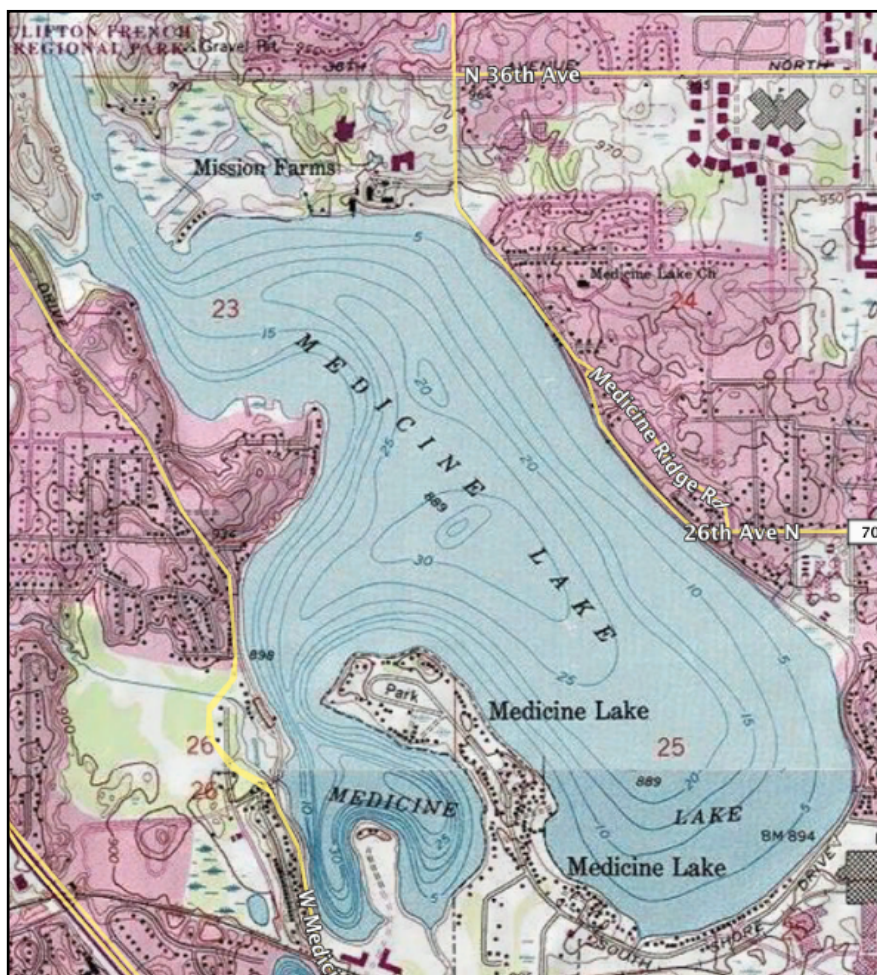
The use of improved sonar equipment to record images with increased detail and clarity directly affected underwater archaeological reconnaissance by facilitating efficient dive planning. Specifically, it eliminated the need to dive on dozens of anomalies that turned out to be false targets - unusual bottom contours, rocks, and trees. Further, MHM can identify maritime sites such as docks, boat lifts, dock canopies, and steam boilers to determine if dive reconnaissance on those objects is necessary, depending on their location and other factors. For the MSLNA-2 Project, dozens of anomalies in the 4 lakes were identified as false targets - determined by their acoustical signature and comparisons with previously recorded sonar data - without diving on them. In addition, the new equipment allowed MHM to record detailed acoustical signatures of known wrecks and other sites to further our knowledge about them; this ability is particularly useful in low visibility waters. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites



and anomalies into their historical contexts. Minnesota Archaeological Site Forms were filed with the OSA when appropriate.

## Results

After the completion of the MSLNA-2 Project fieldwork in late October 2018, there are now 9 identified wrecks, 1 maritime site, 3 objects, and 2 possible wrecks in Lake Pulaski; 3 identified wrecks, 1 unidentified wreck, 3 possible wrecks, 5 possible maritime sites, 3 'other' objects, and a series of barrels and poles on the bottom of Medicine Lake; 2 wrecks, 4 maritime sites, 2 'other' objects, and 6 possible wrecks in Lake Johanna; and 3 identified wrecks, 1 unidentified wreck, 5 possible wrecks, 9 maritime sites, and 6 other sites or objects on the bottom of Prior Lake. Some of the sites and objects have not been dove upon yet, but may be investigated using SCUBA in the future. The anomalies were identified through underwater archaeological reconnaissance fieldwork using SCUBA, digital video, measured drawings, improved side and down-imaging sonar, and maritime historical research. Of the 17 identified wrecks in these 4 lakes, 7 of them now have Minnesota archaeological site numbers. During the MSLNA-2 Project specifically – MHM and its volunteers identified 7 new wrecks, 11 new submerged maritime sites, 8 'other' objects, and confirmed the existence of 2 other wrecks using sonar.



Medicine Lake (USGS).

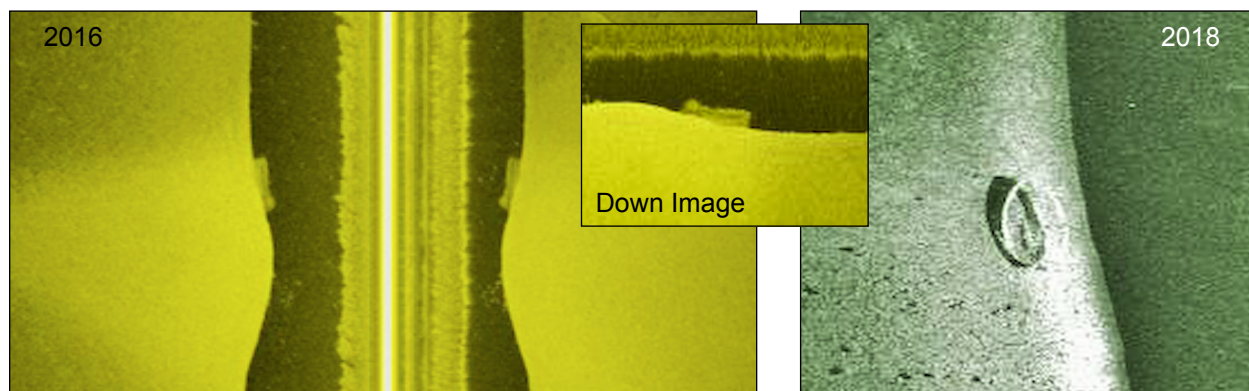


## Medicine Lake Project Results

During the MSLNA-2 Project, MHM's targeted side and down imaging sonar re-scanning of Medicine Lake using updated sonar equipment allowed for the identification of several poles and downed cables or wire that may have been sections of a power line known to have crossed the lake (A64, A65) or tree stumps in shallow water (A60a-A60i), 7 barrels (A34.1-A34.7), and 72 anomalies as false targets comprised of bottom contours or vegetation (A1-A5, A8, A9, A11-A17, A19-33, A35, A37-A45, A47-A51, A53-A58, A61-A63, A68) without dive reconnaissance. Other anomalies remain unidentified after sonar review including 3 possible wrecks (A10, A36, A70), 2 possible dock sections (A35, A67), a possible boat lift (A52), a possible fish house (A 59), a possible pontoon or boiler (A69), a possible car and parts (A73.1-A73.2), a large and substantial object (A46), and 2 rectangular objects (A71, A72). In 2018, using the improved sonar data and SCUBA reconnaissance, 3 wrecks (A6, A7, A66) were identified and rudimentarily documented on the lake bottom. Lastly, Anomaly 18 is a wreck that was not dove upon during the MSLNA-2 Project.

### Steel Launch Wreck Site, 21-HE-516 (Anomaly 6)

MHM's 2016 sonar data of Anomaly 6 suggested the object was large and probably a wreck. Sonar footage from the MSLNA-2 Project survey produced remarkably clear data of the site and the Steel Launch Wreck was identified in mid-October 2018. The wreck is 19.70 feet long and 5.60 feet in the beam amidships. The wreck has a pointed bow and a 'Normand' Torpedo Stern, also known as a French Stern, named after accomplished French naval architect F.A. Normand in 1904 (Nock 1907, 14-15). This torpedo stern design differs from the Lake Minnetonka Streetcar Boat stern in that, while it is pointed, it also has a 'scalloped' wedge design on the port and starboard stern quarters. This design innovation, an improvement over square transoms (that caused large wakes under speed) and curved transoms (that were sluggish when traveling astern), left no wake when traveling at any speed. While this stern design was named for F.A. Normand after the turn of the 20th Century, it was developed by the 1890s. MHM has determined - based on the placement of the drive shaft - that the engine was placed just forward of amidships. Therefore, while Anomaly 6 could have been powered by steam or gasoline because of this design and the wreck's size, MHM contends the site is a gasoline launch. Further, a small attribute on the inside stern may be an attachment point for a pintle of a rudder stock that attached at gunwale level as opposed to beneath the transom.



The Steel Launch Wreck's hull is fabricated from sheets riveted together and from what could be ascertained, each side has 3 sheets at a minimum, and the stern is an additional piece. The stempost is composed of wood and sheathed in steel; MHM supposes the keel is also constructed from steel-sheathed wood. Two considerable - although fragmentary - wooden gunwale timbers/stringers are attached to the outer and inner hull and a caprail survives in places. A substantial rubrail protrudes from the outer hull - also fragmentary in places - and it has a thin reinforcement strap attached to it. Slot-headed screws are visible at the bow and along the gunwale timber. Green and white paint survives in places on the rubrail, reinforcement strap, and gunwale timber, with some red paint also seen on the timber. The outer hull appears to be another shade of green, with rust spots seen all over the wreck. Anomaly 6 is strengthened inside throughout with wooden construction attributes including a keelson, sister keelson, floors, frames, futtocks, and an athwartships timber stern timber that likely supported a gas tank. The keelson is seen at the bow, amidships, and near the stern; it is covered in silt forward and it has a break in it toward the stern. The sister keelson is located amidships; it has a slot cut out of it to accommodate the shaft log that houses the propeller shaft before it disappears through the bottom of the hull. One small piece of Anomaly 6's ceiling planking survives on the starboard side forward, attached to a frame with a large drift pin. On the port side forward, 2 metal straps that end in flat hooks near the turn of the bilge can be found; they likely secured boat piping or electrical cords. At the turn of the bilge on the port side amidships, MHM contends a round hole cut through the hull was used to accommodate a water discharge pipe. A similar hole is located just under the rubrail on the starboard side forward.



Bow

Images of the Steel Launch Wreck (MHM).



Metal Sheet Seam



Bow



Rubrail, Reinforcement Strap, Gunwale Timber





Images of the Steel Launch Wreck (MHM).



Based on her construction attributes and material, MHM contends Anomaly 6 was likely constructed between 1900-1905, but she could have been fabricated in the 1890s. She is possibly a Minnesota-built boat - Normand torpedo stern vessels were produced in the state by the early 1900s -but they were made of wood. In the late 1890s and into the early 20th Century, the Minneapolis steel boat-building firms - the Minneapolis Steel Boat Company, O'Hara's Boat Company, and Sanderson's Boat and Engine Company - constructed small metal vessels, often rowboats. They were well-constructed, but they were small and did not carry engines or motors. Also, these firms and others (for example, the Minneapolis Implement Company and Shadegg Engine Company) acted as retailers for other steel boat producers such as Pearson Boat Construction Company of Duluth, W.H. Mullins Company of Salem, OH, and the Michigan Steel Boat Company of Detroit (*Minneapolis Tribune*. 1904a-b, 1910; *Minneapolis Journal* 1902, 1905). Therefore, the Anomaly 6 was probably constructed by a non-Minnesota company; an example from the Michigan Steel Boat Company closely matches the wreck. To date, the Steel Launch Wreck is the largest metal wreck MHM has identified on the bottom of a Minnesota lake or river. Based on the hull's condition - primarily intact but slowly deteriorating - MHM contends the Steel Launch Wreck was stripped and scuttled in the



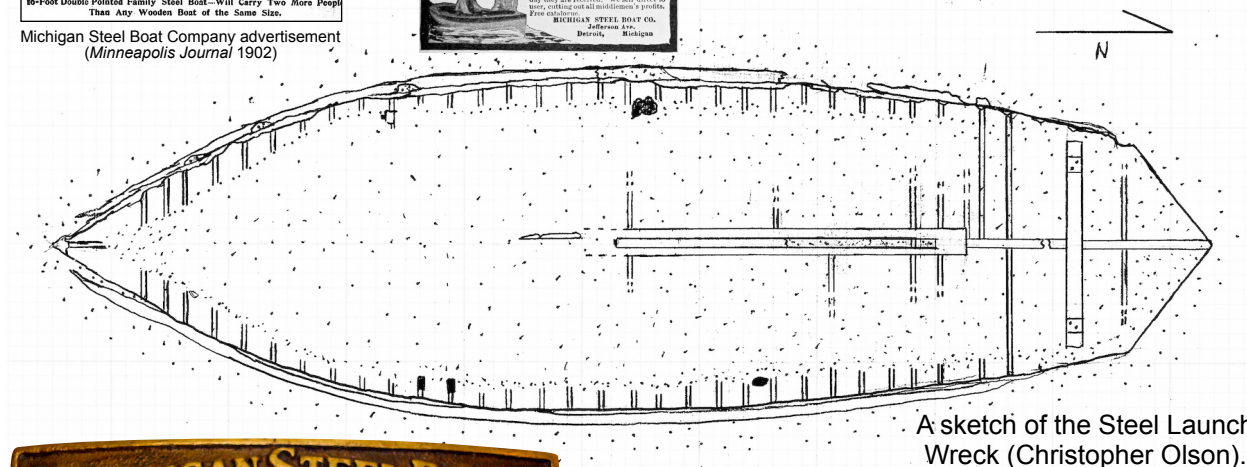
1920s. While metal boats were touted as 'unsinkable' and that they survived exceedingly longer on the water than wooden vessels, MHM determined the 1920s sinking date based on the economic conditions at that time and the expense of operating a rather large boat on a smaller lake. MHM submitted an archaeological site form for the wreck to the OSA in early January 2019 and received her site number, 21-HE-516, at that time.

**Steel Boats Live Long.**  
Never Leak or Sink, Last a Life Time, Cannot Warp, Crack or Water-soak, are Lighter than Wood and Cost Less---Will Float When Filled With Water.  
HANDSOME ILLUSTRATED CATALOGUE MAILED FREE

**16-Foot Double Pointed Family Steel Boat--Will Carry Two More People Than Any Wooden Boat of the Same Size.**

**16ft. Steel Launch with 24HP Engine complete \$96**  
15-21-35 foot launches at proportionate prices. All launches fitted with two cycle reversing engines with speed controlling lever; simplest engine made; starts without cranking; has only 3 moving parts. Steel rowboats, \$30.00. All boats fitted with water-tight compartments; cannot sink, even if holed down.  
We are the largest manufacturers of pleasure boats in the world. Orders filled day they are received. We sell direct to you, cutting out all middlemen's profits. Free catalogue. **MICHIGAN STEEL BOAT CO.** Detroit, Michigan

Michigan Steel Boat Company advertisement (Minneapolis Journal 1902)



## This Magnificent Steel Launch

**Stylish 16-Footer Fully Equipped with Engine Ready to Run!**

1911 models of the Michigan Steel Launch are now ready for delivery at the lowest prices quoted on boats anywhere. Our special low price schedule for immediate orders covers every launch we make--16, 18, 20, 23 and 27 footers. All sizes in stock for immediate shipment. We are the sole owners of patents covering rolled-seam constructed boats. This construction lasts practically a lifetime. We have the only construction that has successfully made the terrific trip through Grand Canyons of Colorado and Arizona. Write for booklet describing trip. Free fully illustrated catalog shows all 1911 Models. Don't buy a launch until you see this book. Write for special proposition and prices to Demonstrator Agents. STEEL ROWBOATS, \$20. Need no boathouse.

**Gold medals awarded our Boats and Engines by Royal Imperial Tech. Society, St. Petersburg; International Exposition, Milan; Nat'l Motor Boat Show, Paris.**

**The Non-Sinkable Boat--Absolutely Safe!**

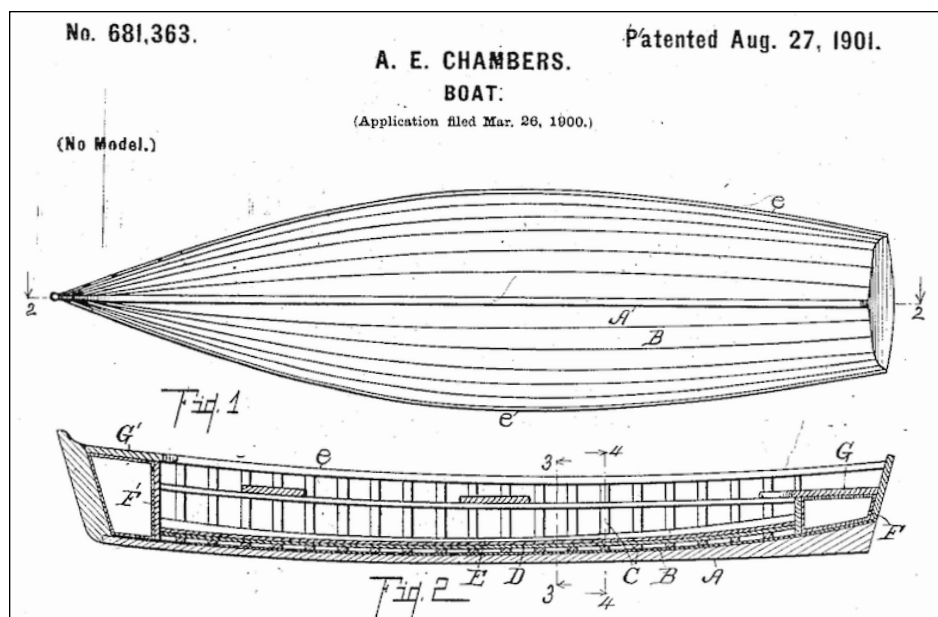
Leave your Michigan Launch in the water or out on the beach in all kinds of weather for months. It is puncture proof. Equipped with the wonderful Detroit Engine, guaranteed for five years, any horse-power from 2 to 50. Fewest moving parts of any engine made. Anyone can run it.

**MICHIGAN STEEL BOAT COMPANY,**  
1273 Jefferson Avenue, Detroit, Michigan, U. S. A. (77)

# \$96

**Needs No Boathouse**



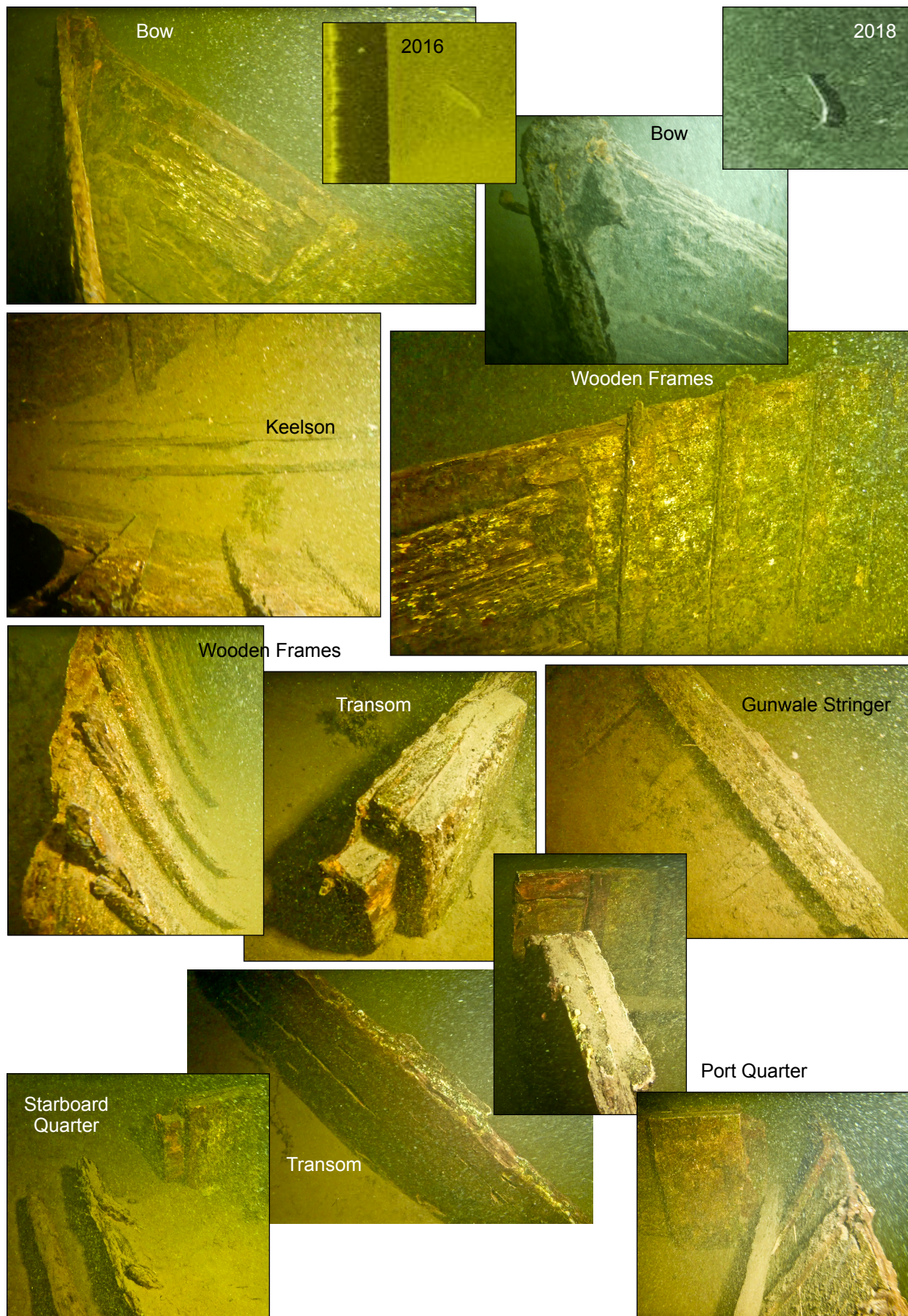


Patent Number 681,363 was awarded to Arthur E. Chambers of Kalamazoo, MI, for a steel boat design. The boat plan shown here is a generic hull that does not match the design of the Steel Launch Wreck on the bottom of Medicine Lake. However, the wreck incorporates the significant design attributes described in the patent narrative (Chambers 1901).

### Wooden Outboard Wreck, 21-HE-517 (Anomaly 7)

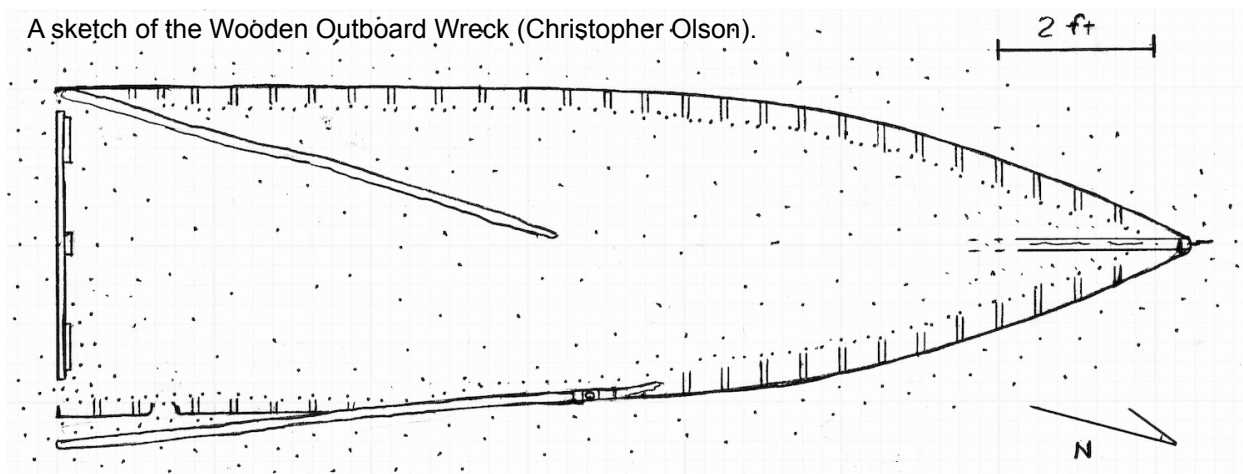
In 2016 MHM recorded a sonar image of Anomaly 7 and its shape suggested it was a wreck. In 2018, MHM recorded a distinct image of Anomaly 7 and confirmed she is a wreck. The Wooden Outboard Wreck is 14.40 feet long and 3.30 feet wide at the transom; . Anomaly 7 has a pointed bow and a square transom. She is carvel-built - comprised of several strakes - with an intact gunwale on her starboard side amidships and aft, with a partial caprail surviving. An L-shaped metal plate with a round oarlock is attached to the caprail by a nail and rove. The port side gunwale stringer has detached and is lying in the hull. Both stern quarters have detached from the transom, causing the wreck's sides to fall away from the centerline and splay outward. The stempost can be seen at the bow; a drift pin secures a damaged towing loop that extends forward. The wreck is covered in several layers of paint at the bow; some has peeled and individual strakes can be seen in places. At different areas on the wreck, white, green, and blue paint survives in different layers. Narrow frames and futtocks are extant throughout the hull and the keelson survives intact, part of it covered with silt. The transom is comprised of a series of strakes that are mostly covered in paint. On both corners of the inner transom, substantial wide vertical supports - at one time - provided strength to the port and starboard quarters. At the center of the transom, another vertical support acted as a motor board and provided strength for an outboard motor. The wreck originally had at least 3 and possibly 4 bench seats that are no longer extant. The thick paint covers most of the wreck's fasteners, but 3 round head nails are seen on the port side transom and 2 nail shafts protrude through the strakes at the port quarter. The wreck no longer has her registration number, but a validation sticker survives on the starboard bow. It is black and expired in 1966. Considering the Wooden Outboard Wreck's construction attributes and design - including the use of wire nails instead of wood screws in her fabrication - MHM contends Anomaly 7 was constructed in the 1930s and she was intentionally scuttled around 1966. MHM submitted an archaeological site form for the wreck to the OSA in early January 2019 and received her site number, 21-HE-517, at that time.





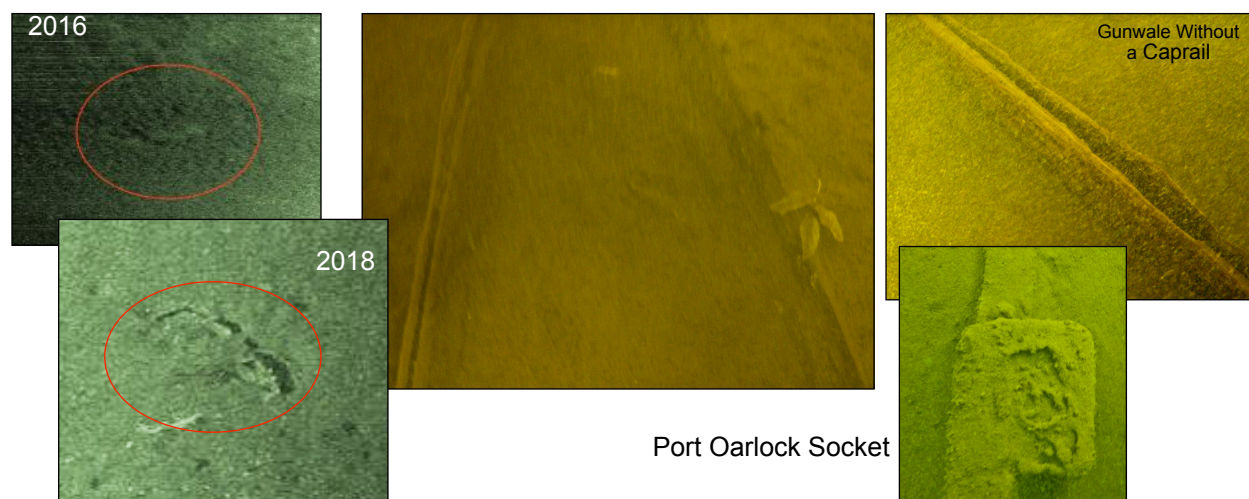


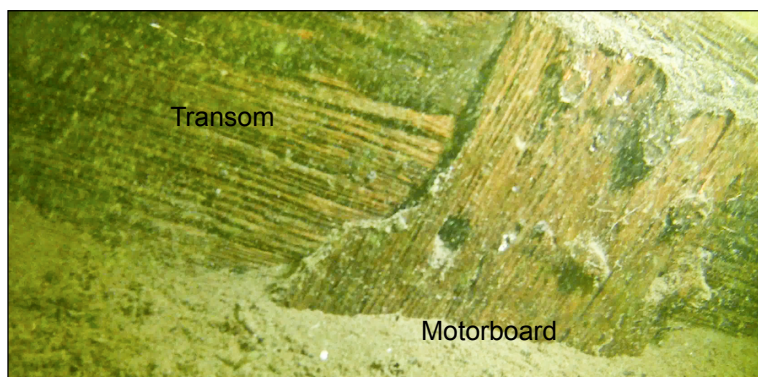
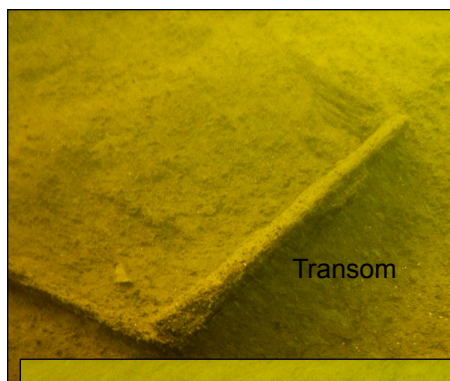
A sketch of the Wooden Outboard Wreck (Christopher Olson).



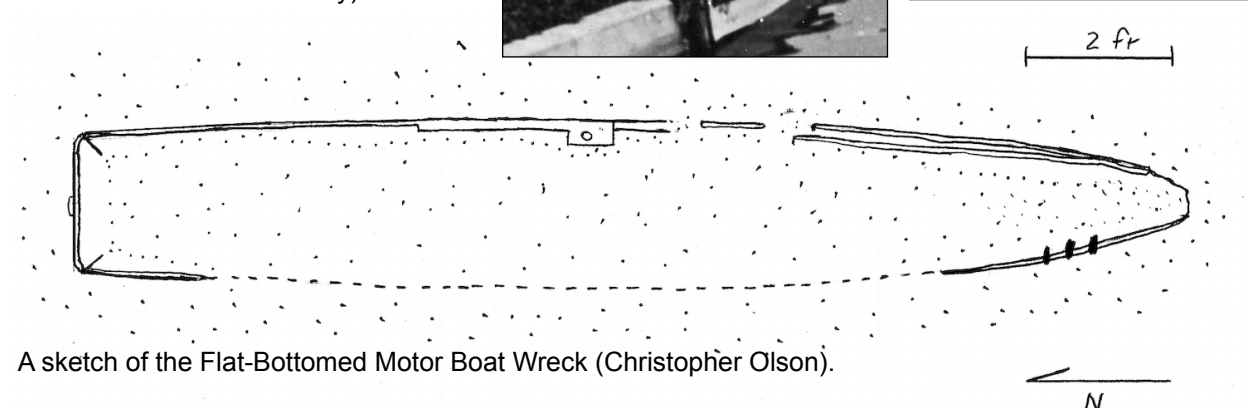
### Flat-Bottomed Motor Boat Wreck, 21-HE-518 (Anomaly 66)

MHM recorded sonar footage of Anomaly 66 in 2016 but it was indistinct smudge on the lake bottom just outside the weed line. In 2018, more distinct images of Anomaly 66 were recorded, allowing for its identification as a wreck, although it is nearly buried. The wreck is 15.20 feet long and 1.80 feet at the transom; the widest beam is approximately 3.00 feet, but a precise measurement was not possible because the starboard side of the wreck is mostly buried. The carvel-built wreck's bow is sharply pointed and damaged, although the stemblock survives; it is assumed the stempost is partially intact in the silt. On the port side bow, a small piece of the trapezoidal-shaped bench survives. The trapezoidal-shaped transom stern is comprised of 2 or 3 strakes; the topmost strake is angled downwards at its port and starboard ends. A damaged motor board is attached to the outer hull and the wreck has ceiling planking throughout. The gunwale is intact with the exception of the caprail; the number of frames incorporated into the construction cannot be determined and an oarlock socket survives on the port side amidships. On the port side quarter, at the turn of the bilge, a longitudinal stringer can be seen through the silt. Based on knowledge gained from previous studies - and the placement of the bilge stringer - MHM contends Anomaly 66 has a flat bottom and hard chine, the vessel probably has athwartships bottom planking, and it has a substantial keel. Based on the wreck's size and considering contemporary photographs of similar boats, Anomaly 66 has or had 3 bench seats incorporated into her construction.





Small flat-bottomed boats on Medicine Lake that strongly resemble the Flat-Bottomed Motor Boat Wreck (courtesy of Ted Hoshal, Plymouth Historical Society)



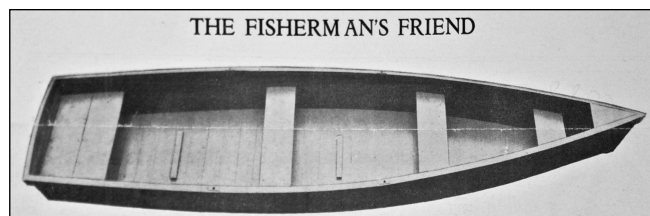
A sketch of the Flat-Bottomed Motor Boat Wreck (Christopher Olson).

The Flat-Bottomed Motor Boat Wreck is similar in design to the Fisherman's Friend line of boats produced by the Ramaley Boat Company in 1913 or later at their Wayzata location on Lake Minnetonka. The vessel's basic design is straightforward; compared to Anomaly 66 - *if* the wreck has athwartship outer hull planking - the only substantial difference between the wreck and a Fisherman's Friend is the presence of ceiling planking. Four Fisherman's Friend Wrecks have been identified by MHM on the bottom of Lake Minnetonka (21-HE-485, 21-HE-489, 21-HE-499, 21-HE-509), a Fisherman's Friend vessel is curated at the West Hennepin History Center and another is housed at the Museum of Lake Minnetonka.<sup>1</sup> Anomaly 66 was likely constructed in the late 1910s;

<sup>1</sup>MHM has documented and 3D scanned this boat; see the *Minnesota Small Craft Project Report*. MHM will be documenting and 3D scanning the Museum of Lake Minnetonka example soon.



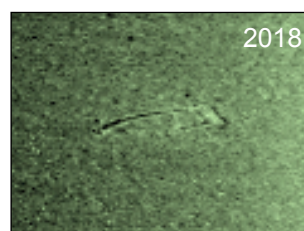
since the average lifespan of a small wooden boat was not extremely long, a site disposition date of 1935 is reasonable. MHM submitted an archaeological site form for the wreck to the OSA in early January 2019 and received her site number, 21-HE-518, at that time.



A Fisherman's Friend watercraft constructed by Ramaley Boat Company (Ramaley 1913).

### **Wreck (Anomaly 18)**

MHM recorded sonar footage of Anomaly 18 in 2016 and it was determined to be a probable wreck. In 2018, a sharper image of the anomaly was recorded and MHM determined it was a wreck. The wreck is approximately 14.00 feet long and will be investigated and identified in the near future using SCUBA reconnaissance.



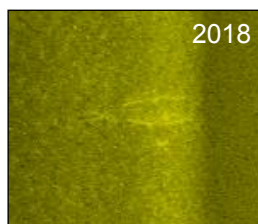
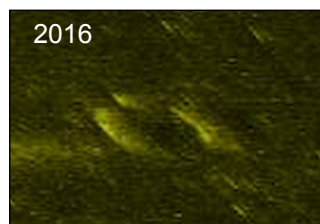
### **Possible Wreck (Anomaly 36)**

In 2016, MHM recorded sonar footage of Anomaly 36 that was distinct but among vegetation and therefore unidentifiable. During the MSLNA-2 Project, Anomaly 36's acoustical signature is larger and has increased detail, suggesting it may be an approximately 20.00-foot long wreck. However, the anomaly could also simply be a large tree or tree branch. MHM will investigate Anomaly 36 using SCUBA in the near future.



### **Possible Wreck (Anomaly 10)**

In 2016, MHM recorded sonar footage of Anomaly 10 that was distinct, but the object was identifiable. During the MSLNA-2 Project, Anomaly 10's acoustical signature has less clarity because it is near the down image of the transect, causing no acoustical shadow. The anomaly is between 10.00 and 20.00 feet long and will require SCUBA reconnaissance to identify it in the near future.



### Possible Wreck (Anomaly 70)

In 2016, MHM recorded sonar footage of Anomaly 70 that was indistinct but suggested a pointed object in vegetation. In 2018, the vegetation had shifted and an object is discernible; it may be a wreck. Anomaly 70 is approximately 12.00 feet long and SCUBA reconnaissance is necessary to identify it in the near future.



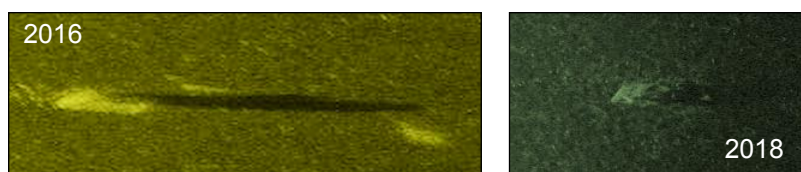
### Possible Car and Parts (Anomalies 73.1-73.2)

In 2016, MHM recorded sonar footage of Anomalies 73.1 and 73.2 that went unnoticed due to a lack of detail. The MSLNA-2 Project sonar recording of these anomalies has increased clarity and detail. MHM contends the objects may be 2 parts of a car; they resemble the body of a car and its engine that is 15 feet away. The Anomaly 73.1 is approximately 8.00 feet long and 73.2 is approximately 4.00 feet long. These anomalies will require SCUBA reconnaissance to identify them in the near future.



### Large Object (Anomaly 46)

In 2016, MHM recorded sonar footage of Anomaly 46 that indicated it was rectangular and large, but no details were evident that allowed for its identification. The 2018 sonar recording of Anomaly 46 has increased clarity and details, but the object is still unidentified. MHM contends the object is partially buried, or as a pile of sediment at its center. It is approximately 14.00 feet long and will require SCUBA reconnaissance to identify it in the near future.



### Possible Boat Lift (Anomaly 52)

In 2016, MHM recorded an indistinct sonar image of Anomaly 52, a rectangular object approximately 10.00 feet long. The 2018 sonar recording of Anomaly 52 has increased clarity and details that suggests it may be a boat lift. Anomaly 52 will require SCUBA reconnaissance for its positive identification.





### Possible Fish House (Anomaly 59)

In 2016, Anomaly 59 appeared to be a rectangular object approximately that is an rectangular object approximately 10.00 feet long. The 2018 sonar recording of Anomaly 59 has increased clarity that suggests it may be fish house. Anomaly 59 will require SCUBA reconnaissance for its positive identification.



### Possible Dock Sections (Anomalies 35, 67)

In 2016, MHM recorded sonar images of Anomalies 35 and 67 that were indistinct and unidentifiable. In 2018, the anomalies are clearly seen, although they are both partially buried. Both anomalies appear to be dock sections; Anomaly 35 is approximately 7.00 feet long and Anomaly 67 is approximately 16.00 feet long. Both anomalies will require SCUBA reconnaissance to confirm their identification.



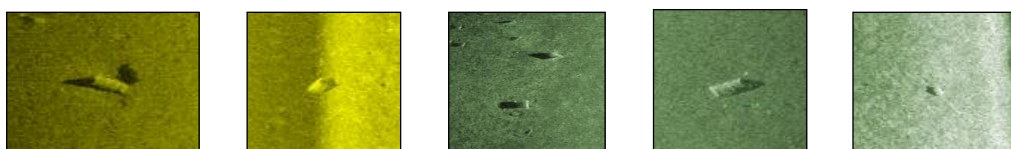
### Possible Pontoon or Boiler (Anomaly 69)

The 2018 sonar image of Anomaly 69 suggests it is a long and cylindrical - possibly a pontoon or a boiler. It is 13.00 feet long and was not discernible in the 2016 sonar footage. Another targeted sonar survey of the area may determine if the object is human made or a natural occurrence. MHM may dive on Anomaly 69 to determine its nature in the future.



### Barrels (Anomalies 34.1-34.7)

The 7 anomalies numbered 34.1-34.7 are located in 2 areas of Medicine Lake and in 2018, sonar footage allowed for their identification as barrels. The barrels may have been incorporated into floating recreational rafts or they may have been discarded in the lake as refuse. MHM contends SCUBA reconnaissance on Anomalies 34.1-34.7 is not necessary unless significant questions about them arise in future research.

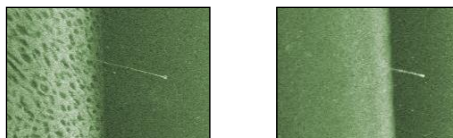


### Possible Power Pole and Tree Stump Remains (Anomalies 60a-60i)

Initially MHM deduced that Anomalies 60a-60i might have been the remains of power poles that once crossed Medicine Lake, but all of them cannot be poles since they are too close together. However, it has been reported that the lake had trees growing from it in shallow areas within the body of the lake. These anomalies would require SCUBA reconnaissance to determine their nature.

### Thin Uprights (Anomalies 64, 65)

Two thin vertical poles are standing off the lake bottom but they are some distance apart from each other. Anomaly 64 is near cables or wires that now run along the lake bottom; No apparent wires or cables can be found near Anomaly 65, but it may be buried. These wires may be power lines that once crossed the lake.



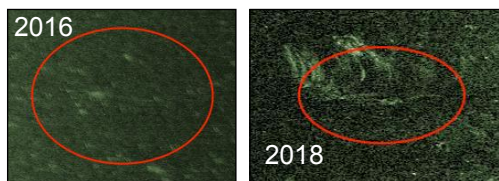
### Rectangular Object (Anomaly 71)

MHM discerned Anomaly 71 in a sonar down image and it is currently unidentified. Another targeted sonar survey of the area may determine if the object is human made or a natural occurrence. MHM may dive on Anomaly 71 to determine its nature in the future.



### Small Rectangular Object (Anomaly 72)

Anomaly 72 was not recognized in 2016's sonar footage and in the 2018 recording is better, but not crisp; it is currently unidentified. Another targeted sonar survey of the area may determine if the object is human made or a natural occurrence. MHM may dive on Anomaly 72 to determine its nature in the future.



### Conclusion

MHM identified the only 3 recognized wrecks on the bottom of Medicine Lake during the MSLNA-2 Project - the Metal Launch Wreck (21-HE-516), Wooden Outboard Wreck (21-HE-517), and the Flat-Bottomed Motor Boat Wreck (21-HE-518). Anomaly 18 is definitely a wreck and will require investigation by SCUBA in the future. MHM's targeted re-scanning of Medicine Lake using improved down and side-imaging sonar during the MSLNA-2 Project produced significantly more detailed data. Additional fieldwork will be



required to determine the nature of 3 possible wrecks (Anomalies 10, 36, 70) and a large object with an interesting acoustical signature that may be a wreck, vehicle, or another type of site (Anomaly 46); this anomaly is intriguing. MHM has no plans to dive on the series of barrels (Anomalies 34.1-34.7) and poles/tree remains (Anomalies 60a-A60i) unless research questions arise that can only be answered with additional fieldwork. The other unknown anomalies will require additional sonar survey to produce additional detailed images or SCUBA reconnaissance to confirm their nature (Anomalies 52, 59, 67, 69, 71, 72, 73.1-73.2). Lastly, of the 68 anomalies labeled with a number during sonar review, 32 of them are false targets based on the comparison to data recorded in 2016 and 2018. The use of the more advanced gear has shaved off 1 or 2 years of Phase 1 underwater archaeological reconnaissance using SCUBA. The unknown anomalies may be the physical remains of Minnesota's maritime material culture that represent significant waterborne or sports activities such as ice fishing or transportation. A variety of maritime resources are expected to be found on the bottom of Minnesota's lakes because of their use as shoreline infrastructure that are often susceptible to high winds, such as boat lifts, canopies, dock sections, and entire docks.

As a whole, the MSLNA-2 Project produced interesting and significant results investigating 14 anomalies in 4 lakes in 4 counties using SCUBA. MHM dove upon and identified 7 wrecks, recognized an additional 2 wrecks in sonar data that will be targeted during future research, 14 possible wrecks, 11 maritime sites or objects, and 8 'other' objects in Prior Lake, Lake Pulaski, Medicine Lake, and Lake Johanna. Of the 7 wrecks, MHM acquired Minnesota Archaeological Site Numbers for 5 of them: 1 in Lake Pulaski, 3 in Medicine Lake, 1 in Lake Johanna. The wrecks in Medicine Lake and Lake Johanna are the first underwater archaeological sites identified in these lakes.

The wrecking processes responsible for the creation of Minnesota's submerged cultural resources have produced a variety of underwater sites. Identifying, comparing, and associating these new sites in Lake Johanna, Medicine Lake, Lake Pulaski, and Prior Lake with known sites increases our understanding of the historical context within which these cultural resources operated or were exploited by Minnesotans. Future studies will greatly enhance our shared maritime history through the recognition of submerged cultural resources and the stories behind their construction and disposition. The diversity of nautical, maritime, and underwater sites so far identified by MHM in Minnesota's lakes are tangible examples of the rich maritime history of the area. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Minnesota's submerged cultural resources into the future. MHM continues to re-examine recorded sonar footage from completed remote sensing surveys. Targeted re-scanning has occurred in several lakes using knowledge gained from the comparison of anomalies that have proven to be wrecks or other submerged cultural resources in past projects. With improved technology, future scanning projects will produce clearer data. The results of the MSLNA-2 Project summarized above is connected to all the work that came before and will come after its completion. At this point, watercraft located Minnesota's suburban lakes represent approximately 1,000 years of Minnesota's maritime history and nautical archaeology. In the historic period, the known wrecks represented in these lakes span around 120 years of local maritime culture. It is clear – even through this Phase 1 pre-disturbance nautical archaeological investigation

– that the types of sites that exist in Minnesota’s suburban lakes documented to date are diverse, archaeologically and historically significant, and worthy of great attention.



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